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PROPOSALS FOR EXPANDING
the
UNIVERSITY OF KENTUCKY
FOREST AND WOOD USE DEVELOPMENT PROGRAM

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December 28, 1965

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BASIS AND OBJECTIVES OF THIS REPORT

This report is based on the terms of a cooperative agreement (Contract No. 12-11-009-21609, dated October 1, 1964) between the College of Agriculture and Home Economics, University of Kentucky and the Central States Forest Experiment Station, Forest Service, USDA.

The agreement provided that the Central States Station would: (1) assign a Forest Products Technologist to assist the University "in planning, organizing and activating a program of wood products development, demonstration, and marketing" for the University's "Wood Use Development Center at Quicksand, Kentucky"; and (2) prepare and submit to the University "a final report ---, which will include a recommended program for the Wood Use Development Center."

Although the cooperative agreement is dated October 1, 1964, funds to carry out the agreement were not transferred to the Station by the University until about mid-February 1965. Soon thereafter, I started plans and action to determine: (1) the type of wood use development program being considered by the Department of Forestry of the University, and (2) the recommendations of wood-using associations and industries, foresters, and others in Kentucky and elsewhere relative to a program for the University to undertake.

In making these determinations numerous leaders in the timber growing and wood using industries, forestry extension and service agencies, vocational and academic training, and forest products utilization and marketing research were contacted. More than 65 days, plus several thousand miles of car and plane travel, were devoted to making these contacts and preparing this report.

This report has been reviewed by R. D. Lane, Director of the Central States Station, and E. G. Champagne, Assistant Director in charge of forest products, economics, and marketing research, assisted in its preparation.

We hope this report serves adequately for the purposes intended: those of providing sound bases for the Department of Forestry, the University, and the Coordinating and Advisory Board to use in developing adequate and effective programs in the several areas of improved management and utilization of Kentucky's forests and in man-power training.

INTRODUCTION

The forest and wood use development program of the University of Kentucky is discussed below in a summarized manner. This information plus the statement of accomplishments should be helpful in considering the recommendations contained in a later section of this report.

Project History

The forest and wood use development program of the University is the result of recommendations by the Kentucky Forestry and Timber Industry Task Force appointed, in 1961, by Governor Bert T. Combs. A public facility grant for initiating and activating the program was secured from the Area Redevelopment Administration (ARA), U. S. Department of Commerce, under provisions of the Area Redevelopment Act (Section 8, Public Law 87-27). The request for the grant was the result of cooperation among representatives of the University of Kentucky; Kentucky Farm Bureau Federation; Central States Forest Experiment Station, U. S. Forest Service; and other state and federal agencies in preparing a proposed program for consideration by the ARA. The grant provided for $642,000 to be allotted to the University for construction of facilities and purchase of needed equipment. Additional Federal funds, to assist with the training and retraining phases of the program, have been secured by the University under provisions of the Manpower Development and Training Act (PL 87-415).

Project Objectives

The objectives of the overall program, as stated in the original proposal, were:

> "The principal objective of the Center is to increase employment opportunities and improve the economy of eastern Kentucky through more complete, efficient use of the region's timber resources in harmony with good forest land management. This objective would be reached through:
>
> 1. Determining and demonstrating modern, efficient methods of seasoning, preserving, processing, utilizing, and marketing the timber resources for a variety of uses ranging from rough products to finished consumer goods.

2. Determining and demonstrating logging and sawmilling equipment and methods that will increase efficiency, more fully capture the timber quality available, and lead to more complete utilization of the timber resources.

3. Determining and demonstrating forest management techniques that will increase and improve the timber resources of eastern Kentucky.

4. Training and retraining workers for employment in timber harvesting and wood-using industries.

5. Encouraging and assisting the expansion of existing and establishment of new wood-using industries in eastern Kentucky."

Project Scope

In describing the scope of the program, the original proposal outlined provisions for three physical plant installations and for training and retraining programs as follows:

> "The University of Kentucky, in cooperation with other Federal, State, and private interests would create and operate the Center. To accomplish the objectives of the Center, the following specific activities and programs would be undertaken.

1. A wood-processing, seasoning, preserving, and charcoaling pilot plant would be installed at Quicksand. This pilot plant would determine and demonstrate the practical and economic feasibility of processing and marketing rough, semi-finished and finished products.

2. A logging, sawmilling, and forest management facility at the 15,000-acre Robinson Forest owned and operated by the University and located near Quicksand. This operation would determine and demonstrate modern, efficient methods of logging and sawmilling as well as timber management techniques that would assure a continuing supply of timber for wood-using industries.

3. A timber market yard; location in eastern Kentucky to be determined by a study of timber resources, existing wood-using industries, markets, transportation, and similar factors. The timber market yard would determine and demonstrate the feasibility of providing a public market place for woodland owners, sawmillers, and timber buyers where all kinds of wood products can be concentrated, sorted, and sold. The economic benefits that could accrue to people in the wood industry from this service would also be determined."

"Training and retraining workers for employment in logging, milling, seasoning, preserving, processing, charcoaling, and timber management would be conducted at the installations described above. The activities and facilities at these three installations would be continuously available; (1) as demonstrations; (2) for planned clinics, short courses, and workshops; and for (3) individual consultations on specific technical subjects. Furthermore, the Center staff would provide the continuous technical offsite services required to insure the development of new wood-using industries, expansion of existing industries, marketing of forest products, and improvement of timber management practices."

Project Responsibility

The responsibility for planning, administering, and accomplishing the wood use development program rests with the newly established Department of Forestry, in the College of Agriculture and Home Economics, University of Kentucky.

Governor Combs also established a continuing Coordinating and Advisory Board to assist in those capacities with planning, activating, and conducting the program. Membership on the Board consists of:

Dean and Director, College of Agriculture and Home Economics, University of Kentucky
Commissioner, Kentucky Department of Natural Resources
Commissioner, Kentucky Department of Commerce
Director, Kentucky Bureau of Vocational Education
A representative from the Kentucky Farm Bureau Federation
Three representatives from Kentucky wood use fields, appointed by the Governor of the Commonwealth, to serve four-year, non-recurring terms.

The Director of the Central States Forest Experiment Station, U. S. Forest Service, was requested to participate with the Board as an exofficio member.

PROJECT ACCOMPLISHMENTS

Good progress has been made in providing the physical-plant facilities that were listed in the original proposal to the ARA. The facilities now consist of two units owned and operated by the University. One is located at Quicksand, Kentucky, and the other is at the University-owned 15,000-acre Robinson Forest, some 20 miles away. The third unit, the public timber market place, has not been activated.

The training and retraining program was started promptly with financial assistance from the Manpower Development and Training Act and has been pursued aggressively since the Fall of 1963.

Quicksand Unit

The unit at Quicksand has been activated. Construction of the building, 50' wide by 280' long, and the dry kiln was started in March 1963 and was dedicated, at ceremonies held on October 19, 1963, as the "University of Kentucky Wood Use Center." Almost all of the selected woodworking machines and equipment have been secured. Some installation jobs remain to be completed and a few tooling items need to be secured to make the machines fully operative.

The wood preservation plant, originally planned for the Quicksand installation, has been placed on the Robinson Forest unit.

Plans for providing the charcoaling facilities, that were proposed for the Quicksand installation, are uncertain at this time.

Robinson Forest Unit

The University has owned the 15,000-acre Robinson Forest for several years. Management of the Forest was started in 1925 in a meager way and good programs of timber stand improvement, forest management, harvesting, and sawmilling are now underway.

The request for ARA funds provided for additional equipment to be purchased for use in the proposed program at the forest and for construction of equipment sheds. The equipment sheds have been built and most of the proposed new items have been purchased.

There are now two circular sawmills at the Robinson Forest, one of which is a simple, manually operated unit. The other is fully mechanized with debarker, live-deck, sawyer-controlled automated carriage,

powered conveyors and rolls, and "pushbutton" edger and trimmer. A fork-lift truck is available for movement of logs and lumber at the sawmills. Also at the Forest is a full complement of logging equipment, including crawler and rubber-tired tractor skidders, a hydraulically-powered truck-mounted self-loader, crawler tractor with loading boom, trucks, road construction and maintenance equipment, and numerous small tools.

A complete commercial-size, pressure treatment, wood preservation plant has been secured and erected near "Camp Robinson" on the Forest. The plant was donated by the Koppers Company, Pittsburgh, Pennsylvania, and the University bore the expense (with ARA grant funds) of dismantling and moving it from McArthur, Ohio. Rebuilding of the plant was accomplished late in 1965.

Other facilities at the Forest include housing for personnel and students, a mess hall, and service buildings for their use during training programs.

Timber Market Yard Unit

The proposal as submitted to ARA recognized there would be a delay in the selection of a location for and activation of the proposed timber market yard. Further considerations have raised questions relative to the feasibility of the University establishing the yard.

Three major pieces of equipment -- a rubber-tired skidding tractor, a log hauling truck equipped with a hydraulic operated self-loader and a hydraulic operated log splitter -- were purchased with ARA funds intended for equipping the timber market yard. However this equipment can be used advantageously on programs at the Robinson Forest.

The skidder and logging truck have been used -- under provisions of a cooperative agreement between the University of Kentucky, Kentucky Farm Bureau Federation, a commercial logger in eastern Kentucky, and the Marketing Research Project Office of the Central States Forest Experiment Station at Berea, Kentucky -- to investigate the practical and economic feasibility of use of such equipment in harvesting charcoal wood and sawlogs. The study has been completed. The skidder and logging truck have been reconditioned and they, along with the log splitter, are now at the Robinson Forest.

Training and Retraining Program

Prompt action was taken by the University to plan and organize a Forestry and Wood Technical School soon after it was certain that the ARA grant would be approved.

Additional federal funds were secured by the University, under provisions of the Manpower Development and Training Act, to assist with conducting the school and to cover salary and living expense allowances to the trainees.

The first 9-month school was started in the Fall of 1963 and completed in May 1964. The second class was started on July 27, 1964 and graduated in April 1965.

Considerable difficulty was experienced with the 9-month school as originally conceived because of inadequate screening of applicants. As a result, persons reported for training who were unable to understand and do the classroom assignments. This and other factors caused an excessive number of drop-outs. For instance, only 19 of 42 enrollees for the 1963-64 school completed the course.

Thus, experience indicated a need for changing the training program and a two-year course has been developed in cooperation with the Kentucky Community Colleges program. Enrollees will receive 9-months training at a Community College followed by a 9 months training in forestry and wood utilization at Quicksand and the Robinson Forest. This will be on a terminal program basis, but does not preclude a student who successfully completes the year at junior college and the year at Quicksand from transferring his credits toward a professional degree at a forestry school.

The first classes under the 2-year program were started in the fall of 1964 at the Southeastern Community College, Cumberland, and the Prestonsburg Community College at Prestonsburg. Ten students, 6 from Southeastern and 4 from Prestonsburg, reported for training at Quicksand in the fall of 1965. Thirty students enrolling at community colleges in the fall of 1965 indicated plans for selecting the forestry and wood technician option for further training.

Industry Assistance

Good progress has been made by members of the Department of Forestry especially through the Extension Service and forest and wood use demonstration program staffs, in expanding and increasing assistance

to timberland owners and wood-using industries; both directly and in cooperation with the Kentucky Division of Forestry and the Wood Products Development Division of the Kentucky Department of Commerce.

Short courses have been held, and more are planned, on subjects such as glues and gluing, kiln drying, sawmilling, and lumber grading.

Numerous visits to logging operations, sawmills, and wood processing plants have made it possible to give specific assistance on problems and to secure information on the frequency and urgency of problems that confront the industries.

RECOMMENDATIONS

The following recommendations are made to assist the Department of Forestry, University of Kentucky, in developing forest and wood use demonstration, training, and industry assistance programs along the general lines of those contained in the proposal that was submitted to the Area Redevelopment Administration. The Department also encompasses professional forestry training, forestry extension services, and forestry research which can be used to strengthen and support the forest and wood use development program.

In addition, there will be many opportunities for the Department of Forestry to utilize the capabilities of other Schools and Departments of the University, such as Agricultural and General Economics, Agricultural and Mechanical Engineering, and Architecture, in cooperative and supporting capacities in accomplishing productive and effective forest and wood use demonstration and training programs. Similar opportunities exist for the Department of Forestry: (1) with several State Agencies such as the Division of Forestry of the Department of Natural Resources, Wood Products Development Division of the Department of Commerce, Department of Economic Security, and Bureau of Vocational Training; (2) with Federal Agencies such as the Tennessee Valley Authority and the State and Private Forestry, National Forest Administration, and Research units of the U. S. Forest Service; and (3) with the Kentucky Farm Bureau Federation and private industries.

Recommendation #1 - Unit Names

Develop short, descriptive names to clearly identify the different segments of the forest and wood use development and demonstration, skills training, and industry assistance programs. Use the names consistently and uniformly to establish them, and their coverage, in the minds of everyone: the public, industry, co-workers, cooperators, and others.

Names are needed for the following segments. The names shown in parenthesis are suggested for consideration and will be used in the following sections of this report when referring to those segments of the program.

a. The overall program. (Forest and Wood Use Development Program -- abbreviation: F&WUDP.)

b. The facilities at Quicksand, Kentucky. (Quicksand Wood Use Center -- abbreviation: QWUC.)

c. The Robinson Forest and facilities there. (Robinson Forest Demonstration Units -- abbreviation: RFDU.)

d. The proposed timber market yard. (Public Timber Market Yard -- abbreviation: PTMY.)

e. The skills training and retraining program. (Forestry and Wood Technician School -- abbreviation: F&WTS.)

f. Short courses. (Short Courses -- abbreviation: SC.)

g. The industry assistance (liaison) program. (Wood Industry Assistance Program -- abbreviation: WIAP.)

Recommendation #2 - Advisory Board

Continue the Coordinating and Advisory Board established by Governor Combs, to serve in those capacities, in developing all phases of the Forest and Wood Use Development Program. Select an appropriate name to identify the Board with the program.

Recommendation #3 - Administration Plans

The Chairman, Department of Forestry, if he has not already done so, should develop a complete set of plans for organizing, administering, and financing the Forest and Wood Use Development Program.

These plans should be correlated with the Department's responsibilities for the professional forestry academic training, forestry extension, and research programs.

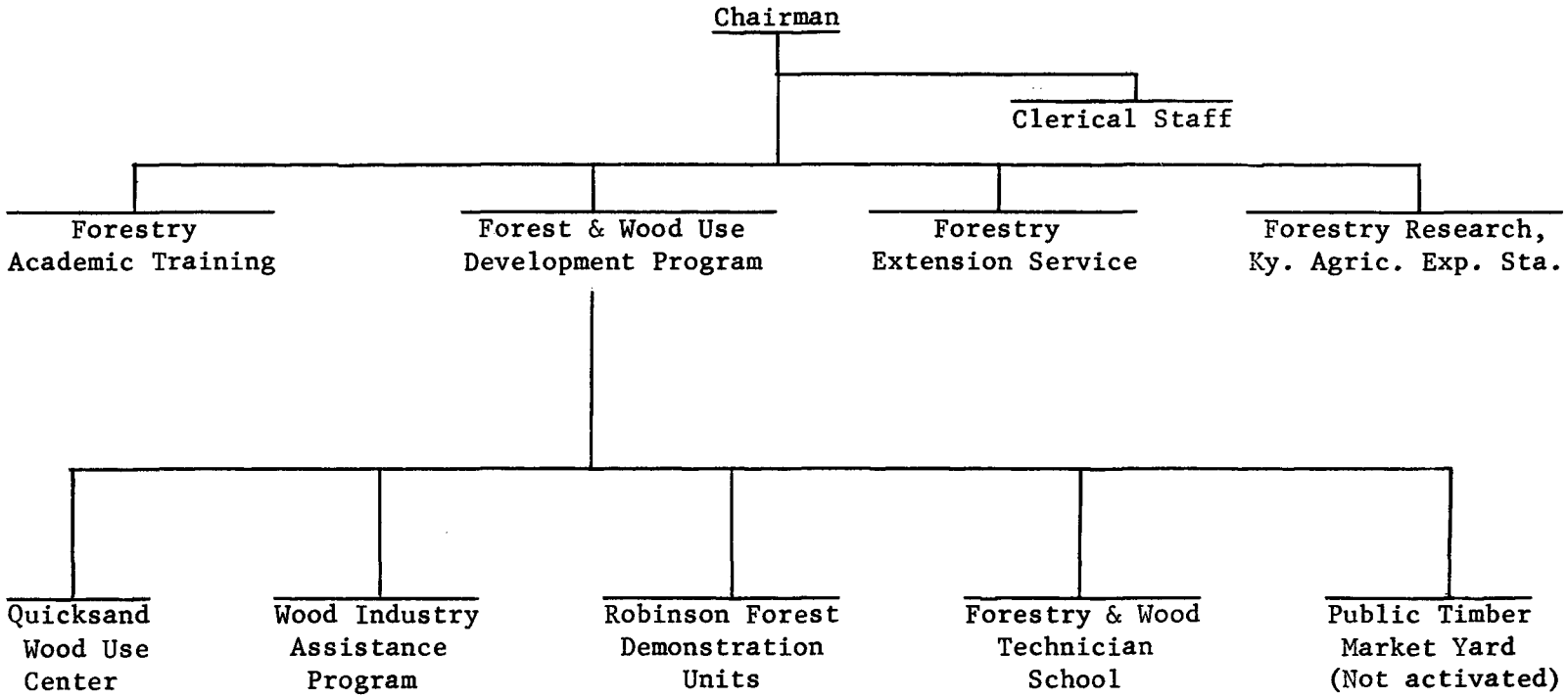
The Forest and Wood Use Development Program should be planned for a specific period in the immediate future -- 5 to 10 years is suggested.

The plans should include:

a. An organization chart for all programs assigned to the Department of Forestry to indicate their inter-relationships (as illustrated on following page) and individual charts for each segment of the Department (as illustrated later for segments of the F&WUDP) showing all positions and their line of responsibility, including supporting staff--forestry aids, tractor and truck drivers, laborers, clerks, etc. (An alternative to this recommendation would be to prepare the organization chart only for the Forest and Wood Use Development Program of the Department.)

ORGANIZATION CHART

DEPARTMENT OF FORESTRY – UNIVERSITY OF KENTUCKY


Chairman
Clerical Staff
Forestry Academic Training
Forest & Wood Use Development Program
Forestry Extension Service
Forestry Research, Ky. Agric. Exp. Sta.
Quicksand Wood Use Center
Wood Industry Assistance Program
Robinson Forest Demonstration Units
Forestry & Wood Technician School
Public Timber Market Yard (Not activated)

b. Written descriptions of line responsibilities and staff duties for all administrative and supervisory positions.

c. Staff recruitment plans and schedules for filling positions.

d. Estimates of funds needed for each year of the 5 to 10 year period, or other selected period, to conduct the planned program.

Recommendation #4 - Staff Qualifications and Duties

In preparing qualification requirements or standards for positions associated with the Forest and Wood Use Demonstration Program greater emphasis should be placed on experience and proven abilities in the skills concerned rather than on academic degree received. For instance, secondary wood industry plant experience and managerial ability should be the major qualification requirements for the position that will supervise operation of the Quicksand Wood Use Center.

Staff duties should be clear-cut by each type of assignment. Dual responsibilities should be avoided to the greatest extent possible. For instance, a person assigned to the wood use and process development program should not be expected to participate substantially in the forestry and technician training program or to conduct research, per se.

Recommendation #5 - Program Plans

The Chairman, Department of Forestry, should also develop specific program plans for each segment of the Forest and Wood Use Development Program.

Specific plans are needed for the following segments:

a. Quicksand Wood Use Center.

b. Robinson Forest Demonstration Units.

c. Public Timber Market Yard.

d. Forestry and Wood Technician School.

e. Short Courses.

f. Wood Industry Assistance Program.

Recommendation #6 - Forestry Research

The proposal submitted to ARA did not include provisions for forestry research. But, the University has had, for several years, a program of forestry research which should be continued and probably can be expanded with McIntire-Stennis funds or other funds that become available to the University. However, it is recommended that the Department of Forestry, and other Departments of the University, program their research staffs and forestry investigations as separate entities from the Forest and Wood Use Demonstration Program but having freedom to use and work with, in a cooperative manner, the F&WUDP facilities and staff. In other words, do not require or expect the F&WUDP staff to "do research, per se."

There will be numerous opportunities, as pointed out later in this report, whereby the records that should be kept by the F&WUDP staff in conducting their normal program operations can be used for research analysis and reporting.

Recommendation #7 - Rotating Funds

Provisions should be made, even though it may require special dispensation to do so under University regulations, whereby the Department of Forestry can sell certain or all products that it grows or manufactures within the F&WUDP and use the incoming funds for growth and production of additional products. Thus, an urgently needed rotating fund would be established for use by the Department for conducting the Forest and Wood Use Development Program.

If such an arrangement is not possible under University regulations, then consideration should be given to developing a cooperative agreement with a wood-using industry or association, or the Kentucky Farm Bureau Federation, whereby operating funds can be provided for continued use by the Department of Forestry for the F&WUDP. Suggestions for such an agreement can be secured from the Central States Forest Experiment Station.

Recommendation #8 - Cooperative and Industry Assistance Agreements

A policy statement should be prepared and a program should be initiated whereby fees may be charged by the University of Kentucky for certain services provided by the F&WUDP for wood-using and related industries and whereby the University of Kentucky can accept cash contributions or deposits of funds, gifts of equipment and materials, and

other types of assistance, for use by the Department of Forestry for conducting the F&WUDP, from any potential source such as private individuals, groups, manufacturers, and industries and State and Federal agencies.

Income from fees, cash grants, and other non-obligated funds should be placed in the rotating fund as proposed by Recommendation #7.

Recommendation #9 - Updating Equipment

Machines and equipment, because of new developments and improvements, soon become out-moded or obsolete. However, it is desirable, especially for the forestry and technician training program, that all phases of the Forest and Wood Use Development Program be currently equipped with items that are modern or up-to-date. Consequently the possibilities of having machinery and equipment manufacturers replace such items on a periodic basis at a nominal charge should be investigated and utilized to the fullest practical extent. This is a common procedure for farm equipment manufacturers in providing assistance to land grant universities.

Recommendation #10 - F&WUDP Screening Committee

An evaluating or screening committee should be established to assist with selection of items to be processed through the production and marketing phases of the Forest and Wood Use Development Program. Membership of the evaluating committee should include the supervisor of the Quicksand Wood Use Center, the person in charge of the Robinson Forest Demonstration Units, and a representative from the staff of the Wood Industry Assistance Program. The Chairman, Department of Forestry, should act in an advisory and executive capacity with the final authority to approve or disapprove committee recommendations. Because of their related activities and the probability that they can make substantial contributions to the product development and marketing program, it is recommended that the following be ex-officio members of the committee: (1) the Utilization and Marketing Specialist for the Kentucky Division of Forestry, (2) the Director, Wood Products Development, Kentucky Department of Commerce, (3) two representatives from the Northeastern Forest Experiment Station, one from utilization research and one from marketing research, and (4) a representative from the Kentucky Farm Bureau Federation.

The ex-officio members should be: (1) kept informed of items that are to be considered by the committee and asked to submit their written comments, and (2) invited to attend committee meetings to assist with the evaluations of difficult or questionable ideas considered for these phases of the F&WUDP.

Use of a form to describe the item proposed for evaluation, to indicate its potential use or market, to record committee action, and approval or disapproval by the Chairman, Department of Forestry, is recommended. This will assure consideration of the ideas and provide a file reference for guidance in making evaluations in the future.

Recommendation #11 - Housing at Quicksand Unit

Short courses that could be held at the Quicksand Wood Use Center, the Forestry and Wood Technicians School, and other uses of the Center are seriously hampered because of lack of facilities at Quicksand for housing and meals for course participants and visitors. Consequently, it is recommended that the University should construct buildings at its Quicksand unit for such use.

The buildings need not be pretentious but should be heated and otherwise adequate for year-around occupancy. They could be constructed so as to demonstrate the potentials of using hardwoods for structural purposes.

Charges could be made to recover costs for lodging and meals furnished to short course participants, F&WTS students, and visitors to the Center.

PROGRAM AND STAFF SUGGESTIONS

The following are suggested programs and staffs which appear logical for the segments of the Forest and Wood Use Development Program. They, too, are based on the logic considered in developing the original proposal that was submitted to the ARA. They also recognize the changes in overall program plans that have been made since the original proposal was prepared.

The facilities at Quicksand and the Robinson Forest were planned for joint uses. Thus, it is necessary to develop clear-cut, specific plans for programs and responsibilities for each use at each location and for coordinating the joint uses of the facilities.

In developing the segment program plans, major emphasis should be (1) placed on finding uses and markets for those tree species, round wood products, grades and sizes of lumber, logging and processing residues, and similar items that are not currently in strong commercial demand, and (2) on developing strong training and retraining programs.

The predictions of future timber production in Kentucky, based on the latest Forest Survey data, should be considered in developing program plans. For instance, yellow-poplar has shown a substantial volume increase in recent years and optimum ways should be developed for using this material when it reaches merchantable size.

Quicksand Wood Use Center

The overall objective of the Quicksand Wood Use Center (QWUC) should be to encourage improved, expanded, and diversified secondary manufacturing and wood-using industries in Kentucky--expecially Eastern Kentucky. It is proposed that this should be done by determining and demonstrating the practical and economic feasibility of using lumber and other products from Kentucky's forests for remanufacture, or other processing, into finished or ready-to-use items.

To attain these goals it is recommended that the QWUC program should be comprised of three phases: a source of ideas for manufactured wood products or product components, new product and market development, and product and processing improvement.

The program should not be limited to products made exclusively from wood or wood by-products. They could logically include combinations of wood with plastics, metals, and other materials to yield a better and more marketable product.

Ideas for Wood Products

The initial efforts of the QWUC should be centered around the making of a wide variety of semi-finished and finished wood products, both large and small, which are known to have good market potentials and could be produced in small to large woodworking shops in Kentucky. A sample or prototype of each product should be made and a leaflet prepared for each which would show a picture of the product, contain complete instructions for making it, and list potential outlets for the product. Other items such as the following should be included in the leaflet.

1. The woods (species) suitable for use in the product.

2. The dimensions of the parts and moisture content at time of assembly.

3. Woodworking machines and equipment required to make the parts and to assemble and finish the product.

4. Suggested machining methods and procedures.

5. Fasteners, glues, and finishes recommended.

6. Descriptions of jigs or forms needed for mass production.

Thus, Kentucky woodworking plant managers and persons considering the establishment of a plant would have a source of product ideas and instructions for making them in their own shops.

It is believed essential that the QWUC make the sample or prototype items. However, they could be patterned after, or improvements of, products that are now on the market. To collect, display, and provide manufacturing instructions for items now in production at Kentucky wood-using industries could result in the QWUC being criticized for stimulating competition with existing manufacturers. And, of course, reproduction of patented items must be avoided or be permitted by the patent holder.

Direct sale, jobbers', and manufacturers' catalogs; house and garden, farm and industry magazines, and trade journals; newspaper advertisements; and other media are good sources of specific ideas and designs for prototype items. The following list indicates the general types of prototype items that could be made at the QWUC.

1. Toys, novelties, and souvenirs.

2. Small decorative, utilitarian, and art objects--ash trays, lamps, candle holders, etc.

3. Lawn, playground, park, recreation, and highway rest area equipment such as: both light-weight and heavy-duty picnic tables, benches, shelters, toilets, numerous play-things, docks, swimming and diving floats, spring boards, bleachers, walks, etc.

4. Fences (panelized units, posts and rail), posts (solid and laminated), and gates (yard and farm).

5. Portable and small permanent structures and equipment (assembled, prefabricated and knocked-down, and precut units) for use on farms and in the beef and dairy cattle, swine, sheep, and poultry industries--feeders, bunks, slotted floor units, farrowing crates, salt boxes, cribs, pole buildings and shelters, horse barn stalls and doors, etc.

6. Dog and cat houses and shelters.

7. Kitchen and food serving specialty items--cutting boards, cutlery racks, rolling pins, plates, trays, etc.

8. Yard, patio, and garden furniture, planters, walks, and floors.

9. Pallets and blocking of various types and designs, including bin pallets for industrial, agricultural, and horticultural use.

10. Baskets, crates, and boxes including fruit and vegetable harvesting items.

11. Turned and other machined items--dowels, furniture parts, mouldings and picture framing, stair rail parts, ladder rungs, spools, rollers, paper roll plugs, tool and utensil handles, brush handles and backs, rulers and yard sticks, make-your-own toy kits, croquet sets, etc.

12. Sporting goods--archery supplies, skis, boat oars, gun-stocks, gun racks, and cabinets, etc.

13. Industrial and commercial items--cable reels, chemical tanks, meatcutting blocks, work benches, truck and trailer bodies and flooring, cross-arms, insulator pins, etc.

14. Highway and road items--wood culverts, guard rails and posts, sign boards and posts, etc.

15. Home, office, business, and commercial furnishings, case goods, storage cabinets, etc.

16. Construction and remodeling items--trussed rafters, prefabricated structural components, flooring, regular and overlaid plain and pre-primed and pre-finished siding with emphasis on use of yellow-poplar, laminated beams, edge end glued boards for resawing to standard widths and lengths, solid and veneered paneling, kitchen cabinets, counter tops, dormitory and apartment clothes closet units, etc.

17. Structures--demonstrations, incorporating prefabricated parts insofar as possible, of vacation and second homes, rustic cabins, pole and rigid-frame farm and recreation area buildings and shelters, etc.

It may be necessary to construct, at the Quicksand site, a building to display the prototype items that are made by the QWUC. The building could be, in itself, a demonstration of use of Kentucky lumber, dimension, and prefabricated materials for framing, siding, and finishing of buildings.

It may be desirable to make production runs of some of the above suggested items to secure information on production methods and costs and consumer acceptance of the items, as proposed below for new product and market development.

New Product and Market Development

This phase of the QWUC program should provide for: (1) securing ideas, from all potential sources, for new and improved wood products that have not been previously marketed but appear to have a good market potential, (2) pilot plant production to establish methods and costs, and (3) determination of user or consumer acceptance of items selected for evaluation.

It is envisioned that this would include mass production of enough units of a given product so the QWUC can: (1) determine the species and grade of lumber to use, the best equipment and processing methods for making the product, and the unit cost of production; (2) place the product on sale in a retail or user outlet to establish its market appeal; and (3) calculate the potential profits that could be expected by a privately owned industry if it manufactured the tested product.

The information secured by the QWUC on production, market acceptance, and profit potential would then be made available, through leaflets as proposed above or otherwise, by the QWUC to anyone that might be interested in making the product.

Sources of product ideas for this phase of the QWUC program would be wood use research and development by such groups as the Spindletop Research Center, State Agricultural Experiment Stations, Forestry Departments at Universities, the Experiment Stations and Forest Products Laboratory of the U. S. Forest Service, Tennessee Valley Authority, other Federal and State groups, and industry Research and Development programs. Other sources for ideas and innovations would be those mentioned in Page 17, industry visitations, and stimulation of suggestions, through "brain-storming sessions" or otherwise, by individuals on the F&WUDP staff. Another source of ideas would be questionnaires or a suggestion form addressed to industry, research organizations, and others to secure their recommendations.

Manufacturers who have ideas for new products normally are reluctant to divulge their ideas to others without firm assurance that the idea(s) will not be passed along to potential competitors. Other manufacturers will be reluctant to request QWUC assistance in improving processing procedures for fear that the improved methods will become readily available to competitors. However, there are many areas where the competitive position of one manufacturer against another will not be improved. And, there are numerous manufacturers who do not have the time, manpower, or equipment for doing development work in their own shop. They would welcome the opportunity for development services on a contractual basis.

For these reasons, it is recommended that arrangements be developed whereby the QWUC can (1) contract with manufacturers, on a fee basis, for product and processing development work done for them, and (2) when requested, assure the manufacturer that precautions will be taken to prevent the product idea and processing knowledge from becoming available to his competitors. The QWUC should not indicate

firm assurance or in any way guarantee that the idea or processing knowledge will not be secured by a potential competitor. To do so could invite lawsuits or other legal entanglements.

The testing of consumer or user acceptance of a product will require arrangements with a department store, wood novelty store, lumber or building materials dealer, or other outlet that would normally use or sell the type of product being tested. It may be necessary to place the product, with the selected outlet, on a consignment basis whereby the user or seller would pay the QWUC a specified price for each item used or sold within a given period of time--the QWUC retaining ownership of all unused or unsold items.

Product and Processing Improvement

This phase of the QWUC program should be directed at assisting wood-using industries in (1) selecting improved designs and materials for producing a better product that is currently in production or a new product that need not be processed through market acceptance determinations as discussed above, and (2) developing improved processing and finishing methods that could be used for manufacture of the product.

This phase of the program should make it possible for Kentucky wood-using industries to bring product items now in production, or ideas, to the QWUC for an appraisal of design and assembly specifications, for determination of the best species and grades of raw materials and the optimum processing equipment and methods to use, and to secure other knowledge with the expectation that these services will assist the manufacturer to make a better product, hopefully, but not necessarily, at less cost.

There are many wood industries, especially the small plants, that are wasting materials, time, and money because they use improper raw materials, poor designs and assembly methods, the wrong processing equipment and methods, and incorrect finishing practices. The services recommended here could be a major step forward in improving the efficiency as well as the competitive and economic situation of those industries.

Here again, a policy should be established relative to charging of fees for these services. Possibly casual or limited assistance of an advisory or informative nature could be provided free-of-charge and fees charged for services of a more complex nature such as redesign and testing or development activities.

Cost, Production, and Other Records

Provisions should be made for maintaining cost, production, and other records that will be needed in analyzing processing methods used at the QWUC.

QWUC Equipment

Some additional accessory parts and equipment, such as cutters and other small items, are needed to make the machines now at the QWUC capable of full use and completely satisfactory for the technicians' training program. These items should be secured and the machines and equipment put into full operating capacity at an early date.

A modern materials handling system should be planned and secured for the QWUC. This means automatic feeding and tailing devices, conveyors, rolls, chains, etc., such as those used in industry for in-plant transfer of materials. This feature of processing can be just as important as the shaping, sawing, or any other manufacturing function in developing, or giving training in, efficient processing methods.

A modern spray finishing system which is capable of duplicating present-day manufacturing operations should be secured for the QWUC. It is needed for the product and processing development program and the training of woodworkers will be incomplete unless it includes the final operation of finishing. In addition, testing and pilot plant programs for finishing wood products could become an important phase of the work at the QWUC.

Some additional items of heavy equipment may be needed in the future for the QWUC. The items needed and urgency for securing them should be governed by the types of products planned for processing and the needs for equipment to round-out the technicians' training program.

When additional or up-dated items of machinery or equipment are to be secured for the QWUC, it would be advisable to consider the possibility of securing the items on a loan basis, leasing or renting them from the manufacturer, or making arrangements other than outright purchase, whereby the cost of maintaining modern equipment at the QWUC can be held to a minimum.

Quicksand Wood Use Center Staff

The program recommended for the QWUC is adequate to justify a staff separate from the staffs of other segments of the Forest and Wood Use Development Program. It is recognized that the QWUC staff will have to cooperate closely with, and may be able to give some assistance to conducting the programs of, other segments of the F&WUDP; however, the primary responsibility should be that of conducting the QWUC program outlined above.

On this basis, the following minimum staff of 6 persons is recommended to activate the program at the QWUC.

Superintendent--a wood technologist, industrial engineer, or other qualified individual, preferable with secondary wood industry experience and proven administrative ability. He will be responsible, under limited supervision, for planning and administering the total program of the Quicksand Wood Use Center, and he will cooperate closely with the supervisors and staffs of other segments of the Forest and Wood Use Development Program. His immediate superior should be the Coordinator of the F&WUDP.

Foreman-- this position will require a man with the ability to understand written instructions and interpret detailed drawings and specifications. He should know machinery, raw materials, wood product processing, and dry kiln operating procedures. He should be able to organize and properly supervise a crew of 4 or more persons, carry out work plans, collect time and production data, and make simple reports. He should be responsible to the QWUC Superintendent.

He should be able to do, and to train others to do, the following jobs: sharpen and fit cutting tools; maintain, design, improvise, and build special equipment; install and adjust knives, saws, cutterheads, other tools and woodworking machines to produce desired patterns or parts; operate a dry kiln; and design simple to fairly complex products made of wood.

Woodworkers--four needed. These should be fairly knowledgeable persons who have been or can be trained to do good and efficient jobs of woodworking machinery operation and maintenance and product assembly and finishing. Each should be trained in the proper skills required for efficient conduct

of the variety of jobs associated with the QWUC program. They should be under the supervision of the QWUC foreman.

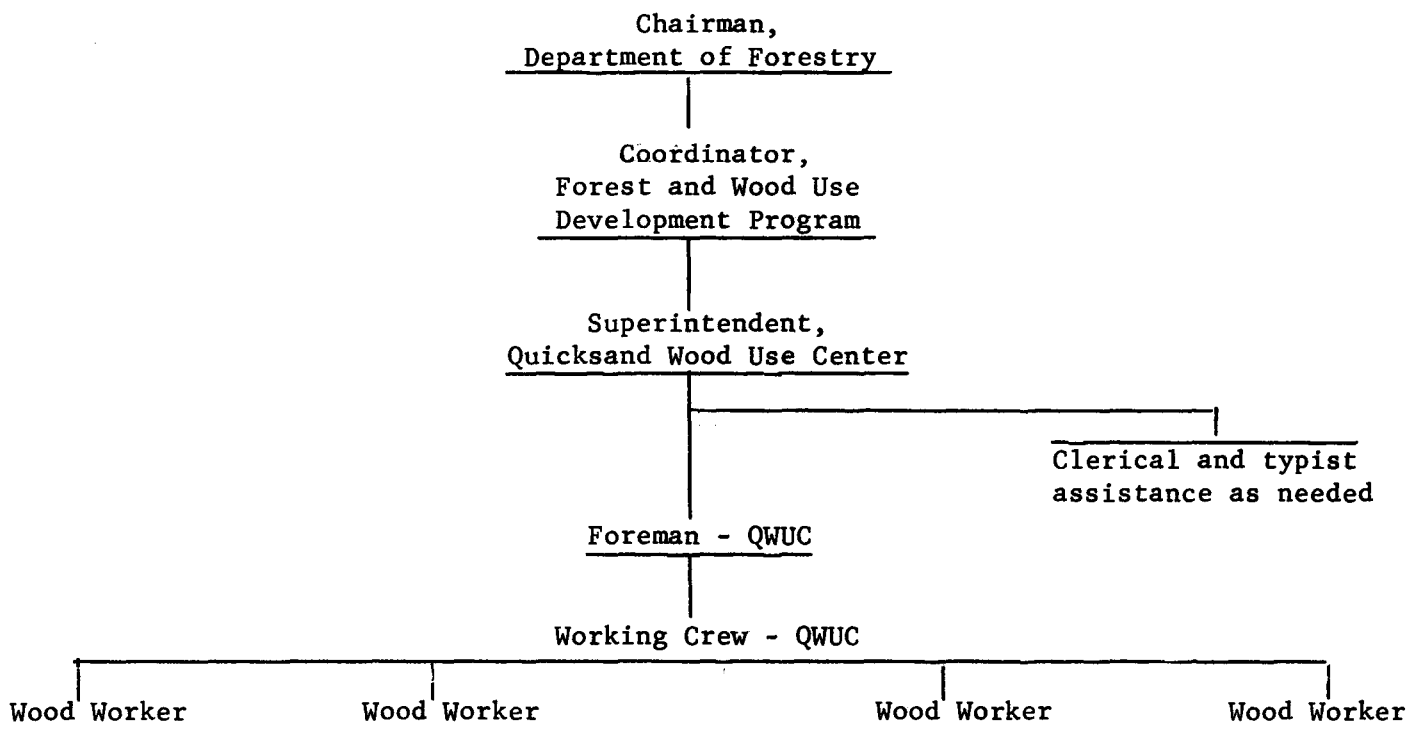
Clerk-Typist--a person capable of typing replies to inquiries and maintaining time reports and other records related to operations at the QWUC. The position should be under the supervision of the QWUC Superintendent.

As the program at the QWUC expands or intensifies it may be necessary to add other positions to the staff such as: an assistant foreman, a millwright, a machine set-up man, and more workers for the processing crew.

The following organization chart indicates the staff suggested, and the recommended lines of responsibility, for getting the QWUC program underway.

ORGANIZATION CHART

QUICKSAND WOOD USE CENTER



(Train each member of the crew to be proficient in a specialized line, such as dry kiln operation, millwrighting and machinery set up, or maintenance of time and cost records, as well as functioning as a member of a processing crew.)

Robinson Forest Demonstration Units

The proposal to ARA anticipated that two activities--forest management and sawmilling--would be centered at the Robinson Forest. However, since then, it has been proposed to also locate the wood preservation plant, and charcoaling activities, if undertaken, at the Forest. This seems logical and this report assumes it will be done. Thus, the objectives of each of the activities now considered as scheduled at the Forest were stated as follows in the original proposal.

> Forest Management - "Determining and demonstrating forest management techniques that will increase and improve the timber resources of eastern Kentucky."
>
> Logging and Sawmilling - "Determining and demonstrating logging and sawmilling equipment and methods that will increase efficiency, more fully capture the timber quality available, and lead to more complete utilization of the timber resources."
>
> Wood Preservation - "The wood preservation program will demonstrate equipment and methods for application of preservatives and/or fire retardants for treating (1) locally produced round wood and sawed products such as posts, poles, and bridge planks for local use and for commercial sales, (2) products fabricated in the Wood Industry Pilot Plant, and (3) lumber and dimension materials for building construction. Treating methods will include pressure, cold soak, double-diffusion, and possibly other methods that are feasible."
>
> Charcoal Production - "The charcoal pilot plant will determine and demonstrate the feasibility of producing charcoal, by kiln batch and continuous retort methods, from round wood and sawmill and wood industry residues. Use of round wood will include determination of the feasibility of salvaging logging residues and plantation thinning and forest improvement cuttings for charcoal production."

The above quoted objectives and other statements in the original proposal seem to imply volume production and marketing of sawed products, preservative treated materials, and charcoal. Volume production of such materials would have to be marketed in direct competition with like products produced by private industry. It seems very doubtful that the F&WUDP should be competing with private industry. Consequently, the following recommendations for each of the Robinson Forest

Demonstration Units are made on the premises (1) that the Robinson Forest management plans and logging operations should be aimed at maximum production and use of the timber products, and (2) that the sawmilling, wood preservation, and charcoaling operations should be mainly for training and demonstration purposes.

The Robinson Forest offers excellent opportunities for demonstrating the many economic and social benefits that can accrue from: (1) proper use and management of forest land, (2) proper silvicultural and tree planting practices, (3) correct road locations, (4) good logging and primary product processing methods, and (5) proper marketing of products. For these reasons there is considerable emphasis in the recommendations on developing demonstrational aspects of the programs at the Forest.

Forest Management

The 15,000-acre Robinson Forest should be managed with major emphasis on the growing and harvesting of the timber crop, but recreational and other uses should be recognized and provided as needed for the area and population served by the Forest.

Development and work plans, including personnel and fund needs, should be prepared for the Forest for a logical period in the future--probably for a 10-year period as a minimum. Proposed long-term use plans for each acre should be programed.

Harvesting and silvicultural treatment plans, based on forest type, site, and stand size and condition, should be developed for the Forest as a whole. Generally, these plans should follow the practices that are currently considered best for the conditions involved from the viewpoints of practical and proper timber management. However, limited areas that are representative of the more frequently occurring forest types, sites, and stand sizes and conditions found in Kentucky should be set aside for demonstrations of other management and silvicultural practices that are not now considered best practices. Thus, there would be direct comparisons of optimum and non-optimum practices.

Harvesting plans should be developed, based on stand conditions, with the objective of attaining, within a reasonable period of time, an annual cut at least approximately equal to the anticipated annual growth. In developing the plans, consideration should be given to the feasibility of developing a forest of uneven-aged compartments, to be managed on an even-age basis, based on the anticipated rotation age for the sites and stands concerned. For example, if the rotation age for the entire 15,000 acres is considered to be 80 years, then it may be desirable to immediately start making regeneration cuts on 175 to 200 acres each year

(15,000 acres ÷ 80 years = 187.5 acres per year). In addition, intermediate and stand improvement cuts on a given number of other acres could be scheduled each year. A cutting plan of this type or any other plan which would result in rather uniform annual harvests of a sizeable volume and avoid high volume harvests at infrequent intervals appears to be preferential.

Top-priority use of the Forest and products from it should be for fulfilling the needs of all segments of the Forest and Wood Use Development Program.

The volume that can be cut annually on the Forest will exceed the needs of the F&WUDP. The surplus items should be sold to commercial outlets as stumpage or logs and bolts. It is almost mandatory, for many reasons, that the Forest manager have full control of all cutting and logging operations on the forest. Consequently, employment of a logging crew and sale of surplus products as logs or bolts delivered to a landing in the forest or to the buyer are recommended. The income from sale of products should be placed in the rotating fund as proposed in Recommendation #7.

Planting of any open areas on the Forest and to convert any poor or undesirable stands to desirable hardwood or softwood species should be planned for early accomplishment.

A master plan has been prepared for a road system on the Forest. It proposes construction of 150 miles of roads to make all areas accessible for fire protection and for logging and other uses. To date, 65 of the 150 miles have been built making 7,000 acres readily accessible. The system should be completed, and a few examples of improper road design, location, and maintenance should be established on the Forest to demonstrate the problems and damages caused by such conditions.

Provisions should be made for maintaining records and determining growth, product yields, and costs and returns information for the forested areas that are under both optimum and demonstration types of management. The objective should be to maintain only those records that are necessary to prove the timber management and economic advantages or disadvantages of the different types of management.

Logging

The logging program, of course, must be coordinated with the harvesting scheduled in the timber management plan for the Robinson Forest. The potential annual cut should be adequate for year-round logging operations.

The program should include determining and demonstrating the advantages of optimum methods for: (1) felling trees; (2) bucking trees for maximum value products; and (3) skidding, sorting, loading, and transporting logs and bolts with different combinations of equipment that would be feasible for use by Kentucky loggers. The optimum procedures for some of these operations have already been established. For other operations it will be necessary to maintain cost and production records to determine the optimum method.

Adequate cost and production records should be kept for all logging operations so they can be analyzed and discussed in relation to the local and Kentucky conditions.

With the exception of a truck-crane type of loader, the large items of logging equipment now available at the Forest seem quite adequate for the immediate future. Provisions should be made for up-dating the equipment as opportunities permit (See Recommendation #9).

The logging equipment should be available for use in the logging phases of the Forestry and Wood Technician School but the logging program should not be dependent on the School program. The training program, however, can provide assistance in harvesting areas that are scheduled for cutting.

The number of crews and crew organization required for the logging program will depend on the planned daily cutting rate. Generally it is better to have a crew or crews assigned specifically to the logging job rather than having the workers change from job to job, such as from sawmilling to logging. However, in view of the limited sawmilling program proposed below, it may be desirable to use some or all logging crew members to assist with sawmilling.

The following are examples of demonstrations related to logging that could be established on the Forest. There are many others.

A. At the Headquarters site (Use placards or other media to explain the tree, log, or other values involved in the comparisons or other factors that are exhibited).

   1. A tree (containing a veneer log, sawlog, dimension bolt, pulpwood, and charcoal wood) bucked into maximum value products compared with two similar trees when bucked to secure sawlogs cut (1) to a specified length and (2) to yield logs of maximum grade.

2. A "sawlog" tree bucked to secure logs of the best grade for conversion into lumber compared to a tree of similar quality bucked to secure logs without regard for log grade.

3. Wasteful bucking of a tree bole illustrating volume losses due to improper placement of cuts.

4. Exhibits of logs and bolts of different grades when graded for assorted end-uses such as lumber, veneer, dimension parts, etc.

5. Exhibits of the value of a stack of logs (possibly equivalent to an average truck load) when (1) sold by log grade vs. woods-run basis, and (2) sold as sawlogs or pulpwood vs. sorting for sale to maximum value markets.

6. Displays of logging equipment, including that used on the Forest when it is not in use.

B. Out in the Timber.

1. Up-hill vs. down-hill logging.

2. Whole tree, tree length, and log length logging to illustrate effect on residual stand and economics of the different systems.

3. Excessive stump heights and improper jump cuts.

4. Feasibility of salvaging the typical logging residues, plantation thinnings, and timber stand improvement cuttings for dimension bolts, pulpwood, charcoal wood, posts, or some other merchantable product.

5. Proper skid trail locations and lengths.

6. Proper location and size of log landings for bucking and sorting logs and bolts.

7. Proper crew size and efficient use of equipment.

It would be desirable to build, at some future date, a pole-type building or open-sided shelter to house the exhibits at the Forest headquarters site.

Sawmilling and Air-Seasoning

The sawmilling and air-seasoning programs to be planned at the Forest will depend mainly on the needs of the Forestry and Wood Technician School and the short course training programs and on the needs of all segments of the Forest and Wood Use Development Program for sawed and debarked products. Consideration could also be given to producing such products for other Departments of the University under a policy whereby the F&WUDP will be reimbursed for the products.

Even though it is proposed that the sawmills on the Robinson Forest should not be operated on a production basis their use only for training and other F&WUDP purposes may result in production of limited volumes of some items that are not needed by segments of the F&WUDP. Provisions should be made for selling the small quantities of surplus items to other Departments of the University or to commercial outlets. The income from these products should be placed in the proposed rotating fund - Recommendation #7.

Properly oriented air-drying facilities should be provided near the sawmill. They should be adequate for the Forestry and Wood Technician School and Short Course training programs in air seasoning and for demonstrating proper seasoning practices. Space needs and lumber pile bases should be determined on basis of planned separation by species, lumber grades, and sizes for the estimated volumes to be dried. Consideration should be given to providing, at an early date, drying shed and forced-air predrying facilities of sufficient volume capacity to demonstrate their advantages over open-air drying.

The sawmilling and air-seasoning programs should include determining and demonstrating optimum practices for use at Kentucky sawmills.

Adequate cost and production records should be kept to permit analysis and determination of the best methods or systems to use when producing or seasoning the assorted products that can be cut from commercially important local species.

The heavy items of debarking, sawmilling, and log and lumber handling equipment that are now at the Forest seem adequate for the immediate future. Some small accessory items are needed to make

full use of the heavy equipment. It may be desirable, sometime in the future, to secure chipping and bolter saw equipment. As new or additional items of equipment are needed consideration should be given to securing them on a least-cost basis as proposed in Recommendation #9.

Since the sawmills and seasoning yard will not be operated on a volume production basis there should be no need for a full-time crew assigned to these operations. This will present problems of efficient operations in the sawmills and drying yard, but possibly they can be handled as suggested later in the discussion of staff needs for the Robinson Forest Demonstration Units.

The following are a few examples of determinations or demonstrations that could be undertaken within the sawmilling and seasoning programs. There are many others.

A. Sawmilling

1. Lumber grade yields and values by species and log grade, diameter, and length when sawing by different methods such as live-sawing vs. turning logs to recover maximum grade lumber.

2. Costs of debarking and sawing logs of different species, lengths, diameters, and grades.

3. Comparisons of economics of selling ungraded vs. graded lumber and green vs. air-dry lumber.

4. Comparisons of economics of buying logs by grade vs. woods-run purchases.

5. Proper positioning of defects when logs are placed on the sawmill carriage.

6. Debarking--benefits relating to sawmill volume production, costs, equipment maintenance, etc.

B. Seasoning

1. Benefits of using roofs on lumber piles during air drying--include different types of roofs and fastenings.

2. Proper foundations for and stickering of lumber piles.

3. Benefits of end coatings.

4. Sorting lumber by grade, length, width, and species before vs. after air drying.

5. Lumber degrade and volume losses during air drying.

Possibly the pole-type or open sided shelter recommended on Page 31 for displaying logging exhibit materials could be used also for sawmilling and air-seasoning exhibits. If not, it may be desirable to build a separate shelter for that purpose.

Wood Preservation Plant

The preservative treatment plant that was secured from the Koppers Company has been rebuilt on a Robinson Forest site. It is a commercial-size plant with a large capacity cylinder that will be expensive to maintain and operate.

The plant is much larger than is needed for a training program in wood preservation. About the only way it can be used economically for training purposes will be to provide large pans or small tanks that can be filled with wood and preservative before placing them in the cylinder. Then, instead of pumping a large quantity of preservative at a high pressure, air pressure could be used to force the preservative into the wood. This system is commonly used in research cylinders. It produces results which would illustrate to the trainees the factors that affect pressure treating success.

Segments of the F&WUDP will need some pressure treated materials for fencing, poles, buildings, and road construction and for processing into manufactured products. Other Departments of the University may need pressure treated materials for similar uses. If these needs involve an adequate volume of materials it may be feasible to operate the plant on a limited production basis.

Because of the rather large investment that the F&WUDP already has in the pressure treating plant and because of the anticipated high maintenance and operating costs for using the facilities for training and demonstration purposes it is recommended that consideration be given to leasing the plant to a private operator. The feasibility of this recommendation will depend on several factors; however, the University may be able to lease the plant to a private individual or group, or farmer cooperative, for commercial operations and retain, under a cooperative agreement, the right to use the plant for meeting the needs of the F&WUDP.

It is recommended that plans for facilities for the cold soak and double diffusion methods of treating wood should consider the type of material to be treated. Elaborate facilities should not be required for these phases of the F&WUDP.

The double diffusion method requires fresh cut or green wood. Consequently, it seems logical that the facilities for this type of treatment should be located on the Robinson Forest. Thus, they would be convenient to the source of raw materials for treating posts, poles, and sawed items.

The cold soak method requires air-dry or drier wood and it is best to treat the wood after it has been cut to size and drilled or otherwise processed. Frequently it is desirable to dip or soak comparatively small products after assembly. Thus, it seems most logical to have the cold soak treatment facilities on the site of the Quicksand Wood Use Center. There should be no pollution problems associated with the coal soak method if a few simple precautions are taken to prevent escape of the treating materials.

The wood treating program using the cold soak and double diffusion methods should be limited to filling the needs of the F&WUDP for treated items and for training purposes. The training program in the Forestry and Wood Technician School should be utilized to the greatest possible extent to do the treating of items needed by other segments of the F&WUDP.

The preservative and fire retardant treating programs, even though done only on a training and demonstration basis, may result in production of some items not needed by segments of the F&WUDP. The surplus quantities of such items should be sold to other Departments of the University or to commercial outlets and the income placed in the rotating funds as proposed by Recommendation #7.

Possibly some service test installations of treated materials will be justified, mainly for their demonstration values, since the benefits of treating wood are well known.

Cost and production records for treating activities, except as a training media, should be maintained only when they realistically represent commercial or efficient production-type operations.

Charcoaling Operations

The proposal to ARA provided for a cinder block or concrete kiln, a metal beehive kiln, a continuous retort, screening and bagging equipment, and a storage building for charcoal. This implies that production of charcoal in limited volume, at least, was planned.

In view of the current knowledge relative to charcoal production, marketing problems, and economics of producing charcoal, it is recommended that the charcoaling facilities for the F&WUDP be held to the minimum required for training in the skills of charcoal production. It seems doubtful that production of any volume of charcoal, even to the extent of using most of the slabs and edgings from the F&WUDP sawmills, could be justified at this time. Developments in the future may suggest disregarding this recommendation and justify production of limited volumes of charcoal.

It seems that a small retort, a small cinder block or poured concrete kiln, and a metal beehive kiln, would be adequate for the training program. They should be located on the Robinson Forest where smoke and fumes from the operations would not be objectionable to people living in the area. Any surplus charcoal produced within the training program should be sold and the income placed in the rotating fund proposed by Recommendation #7.

Cost and production records, except as a training media, should be kept only when they will be representative of production-type operations.

Staff for Robinson Forest Demonstration Units

The programs proposed above for the RFDU are quite adequate to justify a separate staff. The RFDU staff should cooperate closely with, and may be able to give some assistance to conducting the programs of, other segments of the F&WUDP. However, the primary responsibilities of the staff should be the planning, supervision, and accomplishment of the programs of the RFDU.

Forest management, including timber harvesting, is the only operation proposed as a continuous, year-around job. Sawing and air-seasoning, preservative treating, and charcoaling are proposed as intermittent operations which will be governed mainly by the needs of segments of the F&WUDP for products from such operations and by the needs of the Forestry and Wood Technician School and Short Course programs for using the facilities of those operations.

The wide variety of jobs, in the year-around and intermittent operations, complicates staffing the RFDU in a manner that will provide desired skills and efficiency in the intermittent jobs. The most practical solution, although it probably will not result in optimum arrangements for the intermittent jobs, appears to be the employment of capable individuals for the timber management and logging jobs with the expectation that some or all of them will be used as needed on the intermittent operations of sawing and air-seasoning, preservative treatment, and charcoaling. The following discusses RFDU staff needs on that basis.

RFDU Superintendent - a professional forester or otherwise fully qualified individual. He should be responsible, under limited supervision, for planning and administering all phases of the 4 programs at the Robinson Forest. He should cooperate closely with the supervisors and staffs of other segments of the Forest and Wood Use Development Program. His immediate supervisor should be the Coordinator of the F&WUDP.

Logging Foreman - this position will require a man with ability to follow work plans, to organize and supervise a crew(s) of 4 or more persons, collect time and production data, make simple to semi-complex reports, and cooperate with other segments of the F&WUDP.

He should be able to do, or to train others to do, the following jobs: mark and scale trees for cutting; build and maintain logging roads and trails; all phases of the logging operation; and properly maintain equipment and facilities. He should know the grading and scaling systems for round products destined for various end uses and be able to mark tree boles for bucking into maximum value products. He should be under the supervision of the RFDU Superintendent.

Forest Management and Harvesting Crew(s) - the number, size, and organization of crews, and skills required on them, will be dependent upon the average daily volume of logs and other products to be harvested and the other jobs that must be done within the forest management program.

The logging operations proposed earlier should be adequate to justify at least one crew of 4 or 5 men assigned to felling, limbing, bucking, skidding, loading, and transporting. The logging crew should be under the supervision of the Logging Foreman.

It may be desirable to have a crew of 1 or 2 men, at least during the summer months, assigned to road and recreation area maintenance. The crew should be under the supervision of the RFDU Superintendent.

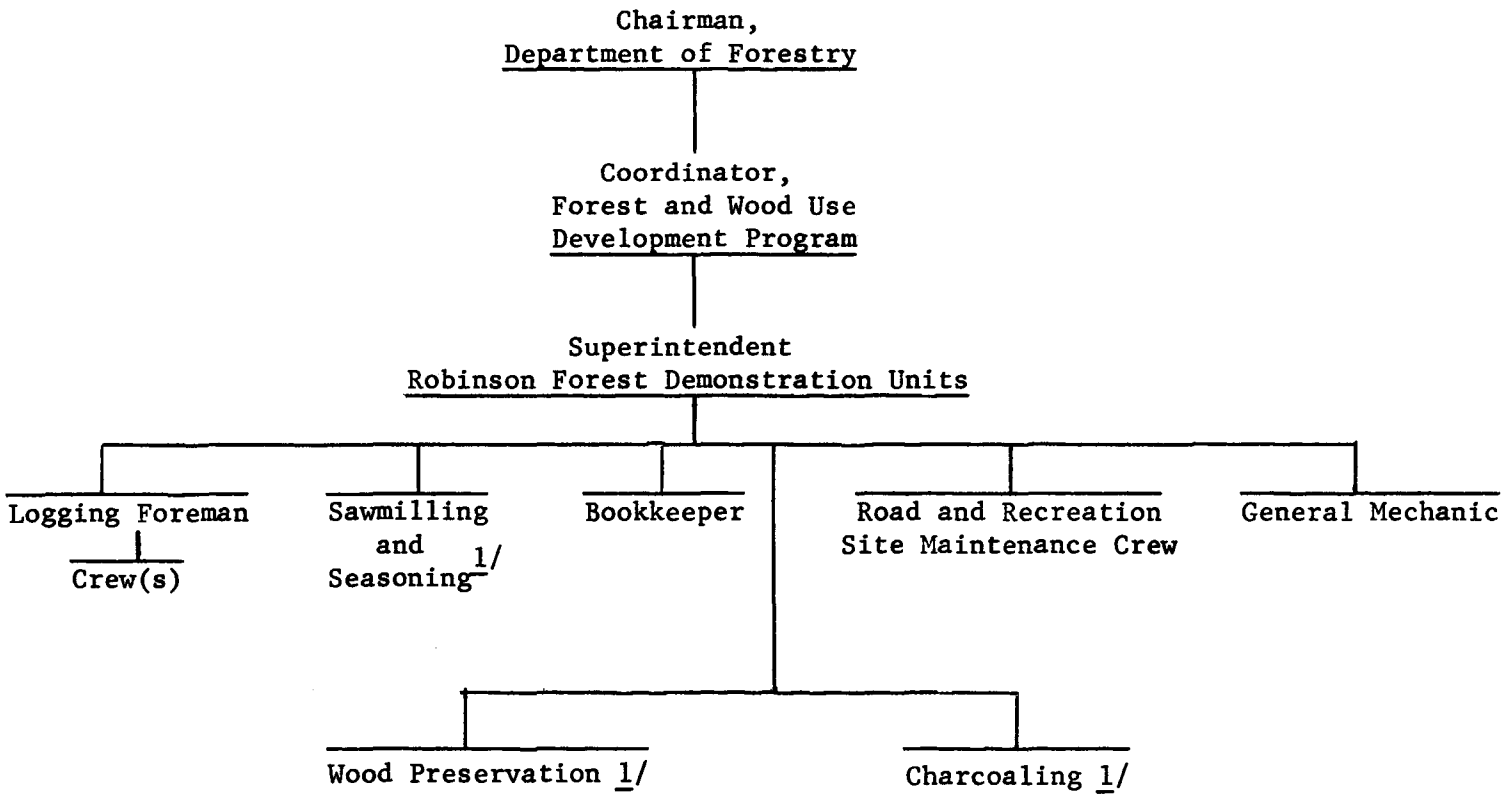
Mechanic - it appears quite probable that the several processing installations and the rather large number of "rolling-stock" items on the Robinson Forest will justify employment of a general mechanic. He should be under the supervision of the RFDU Superintendent.

Bookkeeper or Clerk-Typist - there will be numerous records and maps to be maintained in connection with the timber management and harvesting operations, time reports to be prepared, and other accounting and clerical duties to be performed in connection with the RFDU. Such duties could be an excessive drain on the time of the RFDU Superintendent and Logging Foreman keeping them from doing more important jobs. Consequently, employment of a bookkeeper or clerk-typist is recommended. The position should be under the supervision of the RFDU Superintendent.

The following chart summarizes the proposed staffing for the Robinson Forest Demonstration Units and indicates lines of responsibility.

ORGANIZATION CHART

ROBINSON FOREST DEMONSTRATION UNITS



1/ No full-time staffing is recommended for these activities since they are proposed as intermittent operations. Consequently, it will be necessary to use persons available from other activities on the Forest to do the sawing, seasoning, preservation, and charcoaling jobs.

Public Timber Market Yard

The original statement to ARA recognized the need for a study of local conditions before selecting a location for the proposed Public Timber Market Yard. Further investigation has verified the importance of local conditions and other factors as related to the potential success of the proposal. Some of the troublesome local conditions that have been encountered are outlined below.

a. Lack of interest among the timberland owners in agreeing to sell their forest products to a timber market yard even though the yard might provide timber marking, logging, stand improvement, and tree planting services at a minimum cost.

b. Many loggers already have commitments or contracts, which they are not willing to break, to deliver the products they cut to a specific sawmill or other user. Some loggers even depend on fund advances from the purchasers of their products for the money needed each week to pay their crews and operate their equipment. Consequently, loggers operating under these restrictions could not immediately use the facilities of a timber market yard even though it would be an economic advantage for them to do so.

c. Sawmill managers and other buyers of round wood and lumber are not particularly interested in securing the products they need through a timber market yard. Being fearful that they would have to pay more for the products, they would rather deal directly with the logger or rough product producer. This opinion seems to hold even after a discussion of the several advantages of a PTMY in sorting and channeling products to the best intended use.

Other major factors, in addition to the local conditions, that had to be considered are the requirements for a rather heavy investment in equipment to operate a yard and the need for a very sizeable operating fund to buy and stockpile a large volume of products while awaiting sale and delivery to a purchaser and reimbursement from him.

After full consideration of the troublesome conditions and fund requirements to equip and operate a timber market yard the administrators of the F&WUDP decided to postpone indefinitely the establishment of the yard by the University if the provisions of the ARA grant will permit doing so.

If the University is obligated to establish the yard, then good judgment must be exercised in selecting the location with the best potentials for a successful operation. And, there should be assurance of funds to adequately finance the yard for three to five years, recognizing that deficits probably will occur during the first year or two of operation and, also, that it may be difficult, or even impossible, to develop the yard into a profit-making enterprise.

This report assumes that the yard will not be established, consequently no recommendations are being made relative to location, operation, or staff needs.

Forestry and Wood Technician School

The Forestry and Wood Technician School program came up frequently in discussions with persons interviewed relative to the F&WUDP. Their views may be helpful in planning the F&WTS program.

General concensus approved the 2-year training program, that is now in effect, to develop persons capable of filling positions as supervisors or foremen in the primary and secondary forest industries, but training in specialized fields was also suggested. Briefly, the suggestions can be outlined as follows:

A. Supervisor and foremanship training. Continue the 2-year program but develop curricula which will permit specialization in the following areas:

1. Forest management, tree planting, plantation and timber stand improvement, and logging.

2. Sawmilling and seasoning--with options such as stave bolt and other specialty item production, wood preservation, charcoal production, and dry kiln operation.

3. Secondary processing and manufacturing.

The major reason cited for this suggested specialized training was that individuals wishing to work in one of the areas did not need extensive training in the other areas.

B. Job training. Develop short-term schools, of 1 to 3 months duration, to train persons in the skills of specific jobs. Some examples are:

1. Felling, limbing, and bucking. Include training in log grades, bucking for maximum yield of highest value products, and chainsaw maintenance.

2. Sawyer, edgerman, or trimmerman including training in lumber grades.

3. Woodworking machinery operation--limited to one or a few machines to develop, for instance, an "expert" molder operator.

The philosophy expressed as related to job training was that everyone is not interested in, or capable of, being a supervisor or foreman.

A concerted effort should be made to encourage enrollment in the F&WTS. It should be directed at High School students, school dropouts, and persons now employed in primary and secondary wood industries who would benefit by specialized training.

The assistance of county school superintendents; public and private school superintendents, principals, and teachers; State and County Extension Service personnel; Rural Area Development Committees; Job Corps and anti-poverty program agencies; industry development agencies; owners and managers of wood industries; manufacturers of wood industry machinery, equipment, and supplies; and others should be solicited to encourage enrollment in the F&WTS.

Members of the F&WTS staff should participate in "Career Day" programs at schools. Arrangements should be made for visits, on a scheduled basis, to the Quicksand and Robinson Forest facilities by High School students.

Graduation ceremonies should be held for each class that is graduated by the F&WTS. Invitations to attend the ceremonies should be sent to educators, industry representatives, and others to call attention to the School program.

Provision of facilities at Quicksand for housing and meals for students would also encourage enrollment in the F&WTS (Recommendation #11).

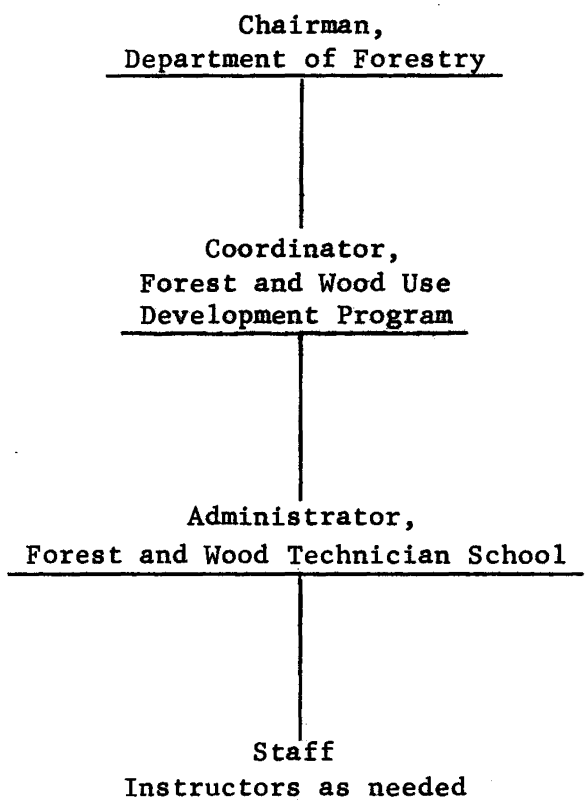
The importance of a well-qualified, full-time staff for the Forestry and Wood Technician School was strongly emphasized. Attempting to use persons assigned full-time duties or major responsibilities in other segments of the F&WUDP to conduct or participate extensively in the F&WTS program is not recommended.

Staff requirements for the F&WTS will vary by curricula planned and student enrollment. It seems that 2 instructors would be the minimum number required. One of the instructors should have responsibility for planning and administering the program. He should be under the supervision of the Coordinator, F&WUDP.

The following organization chart indicates suggested lines of responsibility.

ORGANIZATION CHART

FORESTRY AND WOOD TECHNICIAN SCHOOL



Short Courses

Short courses within the F&WUDP were fully approved by the parties interviewed relative to the program. And, there were numerous suggestions for broadening subject coverage and increasing course frequency.

Thus, a regular program of frequent short courses in both primary and secondary wood industry operations is recommended. The courses should cover subjects such as: log grades, felling and bucking for optimum value products, the various logging operations, chainsaw operation and maintenance, sawmill alignment and trouble-shooting, sawing and edging for maximum value products, air seasoning, kiln drying, lumber grading, saw filing, machinery operation and maintenance, sanding, finishing, foreman training, record keeping and cost accounting, and business management.

Research investigations of Kentucky sawmills indicate there is a great need for improvement of mill management and cost accounting practices. These appear to be good areas for special and early efforts in the short course program.

Assistance should be solicited in encouraging attendance of the short courses from the same groups and agencies as suggested (Page 42) for encouraging enrollment in the Forestry and Wood Technician School.

The F&WTS staff should have major responsibility for planning and conducting the short courses. Specialized assistance could be provided from the staffs of other segments of the F&WUDP, the Extension Service, and Department of Forestry.

Here again, there is a need for housing and dining facilities at Quicksand for short course attendees as proposed for students in the F&WTS (Recommendation #11).

Wood Industry Assistance Program

The Wood Industry Assistance Program proposed within the F&WUDP is urgently needed and there is no doubt about it being fully accepted, provided it is well coordinated with other State and Federal programs of a similar type.

The WIAP should have three objectives. The major one should be, as the name implies, assisting primary and secondary industries to improve processing, manufacturing, marketing, and business management practices that will result in profitable operations.

Another objective should be that of encouraging wood industry participation in the F&WUDP by (1) bringing problems to the staff of the F&WUDP for consideration and solution; (2) contributing to support of the F&WUDP through gifts, grants, and loans; and (3) contracting for process and product development.

The third objective should be that of stimulating industry, academic, State and Federal agency, and public support of the training and retraining phases of the F&WUDP.

The following are suggested media that could be used to accomplish the program objectives.

1. Group meetings at Quicksand Wood Use Center and Robinson Forest Demonstration Units. A continuing and intensive program of scheduled group visits is recommended. Examples of groups that could be invited are:

   a. Timber harvesting and wood processing industries by segments or combinations of segments having common interests. For instance: loggers, pulpwood cutters, sawmill operators, furniture manufacturers, toy makers, and pallet producers.

   b. Manufacturers of and dealers in wood processing machinery, equipment, and supplies.

   c. Officers and members of trade associations.

   d. Editors and Managers of farm and wood-industry trade journals.

   e. Consulting foresters.

   f. Local chapter of Society of American Foresters, Forest Products Research Society, American Institute of Architects, and other professional groups.

   g. Kentucky Division of Forestry--State and District personnel.

   h. U. S. Forest Service--National Forest Administration, State and Private Forestry, and Research--personnel.

   i. State and County Extension Service personnel.

j. Kentucky Farm Bureau Federation--State and county groups.

k. Chambers of Commerce.

l. Rural Area Development Committees or representatives from several committees.

m. Administrators and supervisors of Job Corps and anti-poverty programs.

n. County and school superintendents, principals, and teachers.

o. Vocational training groups--State personnel and school instructors.

p. Community leaders.

2. Individual visits to Quicksand and Robinson Forest facilities. Stimulate forest managers, timber harvesters, and wood users to visit the QWUC and RFDU to secure information and for assistance in solving their problems. This may eventually require specific staffing at the QWUC and RFDU to handle the requests for information and assistance.

3. Develop a news letter to be mailed periodically to forest managers, loggers, and wood processors and manufacturers. Report recent research and industry developments of interest to the various groups. Develop mailing lists by subject matter categories to avoid excessive printing costs and distribution to non-interested parties. Possibly combine with "Growing Gold" issued by Kentucky Division of Forestry.

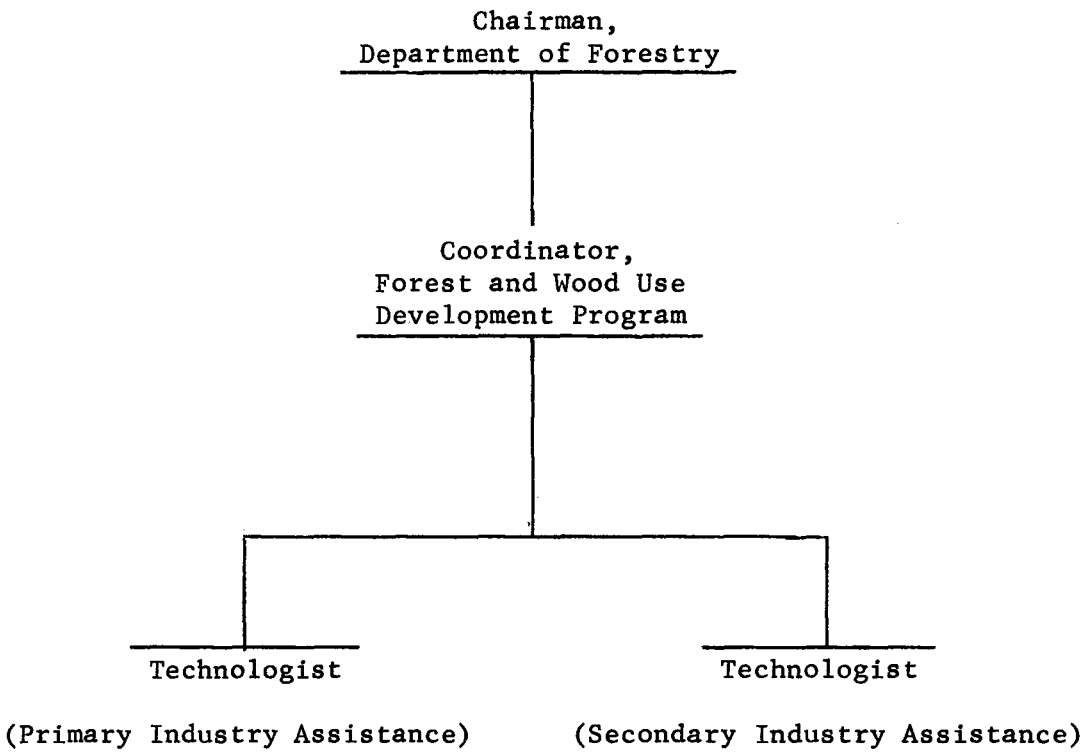
4. Develop a strong state-wide program of personal visits with timber cutters and wood-using industries. It appears that at least two technologists will be required to provide these services, one working with the primary industries and one with the secondary. This service will also provide an opportunity to learn the problems being experienced by the industries so they can be relayed to the QWUC and RFDU for solution.

5. Make the facilities at Quicksand and the Robinson Forest available to logging and sawmilling equipment and woodworking machinery manufacturers and dealers for demonstrations of new and improved operating procedures and new equipment. Encourage the manufacturers to contribute items for this purpose.

The recommended Wood Industry Assistance Program will require technologists well qualified in their respective areas. The suggested organization chart follows.

ORGANIZATION CHART

WOOD INDUSTRY ASSISTANCE PROGRAM



DISPOSITION OF AND REIMBURSEMENT FOR PRODUCTS

A policy should be established and procedures outlined for use and disposition of the various types of products that will be produced within the Forest and Wood Use Development Program and for reimbursement of the producing unit. Inclusion of a statement specifically related to sale of products to F&WUDP and Department of Forestry staff members is recommended.

Products from the Robinson Forest Demonstration Units

The top-priority uses for products from the RFDU should be to supply the needs of all segments of the F&WUDP.

Products from the Quicksand Wood Use Center

Items that are produced in quantity at the QWUC for testing market acceptance should, of course, be used for that purpose.

The QWUC and other segments of the F&WUDP should have first priority on other items that are produced in development or testing of processing, assembling, or finishing methods or within the program of the Forestry and Wood Technician School. A possible exception would be to allow students to pay for materials used and thus acquire ownership of items they make.

Disposition of Surplus Products

The following is a suggested priority sequence for offering transfer or sale of products not needed by segments of the F&WUDP.

1. Department of Forestry - University of Kentucky.

2. Staff members of F&WUDP and Department of Forestry and students in F&WTS if policy statement permits sale to them.

3. Retail sales of small quantities at sales counters at the QWUC and RFDU.

4. Other Departments or units of the University of Kentucky.

5. Surplus items, not needed for the priority uses, should be sold to commercial outlets which will create the least competition with private producers of similar products

with the intent of avoiding criticism of the F&WUDP. For instance, sale of surplus lumber to a privately operated sawmill operator for resale probably would be less apt to create criticism of the F&WUDP than sales to lumber jobbers or to the retail trade.

Reimbursement for Products

Provisions should be made whereby the F&WUDP or the individual producing unit is reimbursed (1) for any products that are transferred to the Department of Forestry and other Departments or units of the University, and (2) for any surplus products that are sold to other outlets. If the costkeeping system used for the F&WUDP establishes accounts for each segment and unit it will be desirable to provide for reimbursing the producing unit for products furnished other F&WUDP segments or units.

Reimbursement for transferred items could be on the basis of actual or estimated cost or an otherwise agreed upon price.

Surplus products that are to be sold should be priced in accordance with commercial prices.

The income from transfers and sales of products should be placed in the rotating fund as covered by Recommendation #7, Page 13.

COORDINATION WITH OTHER PROGRAMS

As indicated earlier there will be a need for very close cooperation and coordination between all segments of the F&WUDP.

In addition, there is an urgent need for F&WUDP personnel to keep well informed of programs being conducted by Federal and other State agencies and institutions. Several other agencies provide forest management and products utilization and marketing services to timberland owners and to the primary and secondary wood industries. In many instances some of the other programs very closely parallel the proposals for the F&WUDP as covered by this report.

Consequently, to avoid public and industry criticism of the programs, either collectively or individually, it will be necessary to coordinate the F&WUDP with other similar programs in Kentucky.

The greatest need for coordination of programs dealing with the public, forest owners, and the wood industries will be with the following groups:

1. State and County Extension Service personnel.
2. Division of Forestry, Kentucky Department of Natural Resources, at both State and District Office levels.
3. Wood Products Development Division, Kentucky Department of Commerce.
4. Northeastern Area, State and Private Forestry, U. S. Forest Service, Upper Darby, Pennsylvania.
5. Northeastern Forest Experiment Station, U. S. Forest Service, Upper Darby, Pennsylvania, especially the several research projects headquartered at Berea, Kentucky; the Hardwood Log and Tree Grade Project at Columbus, Ohio; and the Forest Products Marketing Laboratory at Princeton, West Virginia.
6. Kentucky Farm Bureau Federation.
7. Spindletop Research Center, Lexington.
8. Berea College.
9. U. S. Soil Conservation Service.
10. Consulting foresters.

COOPERATIVE ASSISTANCE FOR THE F&WUDP

There are several potential sources where cooperative assistance can be secured in planning and doing specific phases of the F&WUDP. Such assistance should be sought and used to the greatest practical extent. The following are examples where such cooperation may be available.

Assistance in developing plans for timber harvesting, silvicultural treatments, and tree planting on the Robinson Forest; for collection of data on costs, yields, processing productivity, and economic returns; for marketing investigations; for logging, sawmilling, and road construction; and for other phases of the F&WUDP can be secured from staff members of the U. S. Forest Service research projects at Berea, Kentucky. They may be able to actually assist with certain phases of the F&WUDP that can be used for research analysis and reporting purposes.

Staff members of the U. S. Forest Service, Forest Products Utilization Research Project, Carbondale, Illinois, have had considerable experience in timber harvesting, sawmilling, seasoning, and wood products pilot plant operations. They would be good sources of information on development of work plans, procedures, and forms to use in recording data needed for analysis of processing methods and costs for harvesting, processing, and manufacturing wood products. And they may be able to furnish construction details for the cold soak preservative treating plant suggested for installation (Page 34) at the Quicksand Wood Use Center.

Some phases of the F&WUDP should offer excellent opportunities for research to be conducted by the Forestry, Marketing, Economics, Business Administration, and possibly other Departments of the University of Kentucky.

The Kentucky Division of Forestry may be able to provide some assistance in connection with certain phases of the F&WUDP.

State and County Extension Service personnel should be able to give valuable assistance in promoting the F&WUDP, especially in encouraging use of the services and participation in the training and retraining programs. The State Extension Forester probably should participate extensively in planning and conducting the short courses that are discussed on Page 44.

Manufacturers of and dealers in timber harvesting, sawmilling, and wood working machinery and supplies should be good sources of assistance in conducting demonstrations. They may be able to furnish equipment and skilled operators for training sessions.

Lumber, machinery, and other trade associations are other potential sources of cooperative assistance.